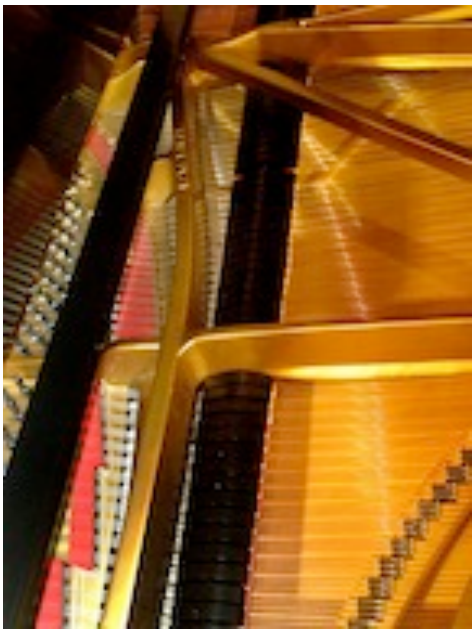
David Andersen Pianos • 6534 Wandermere Rd. • Malibu, CA • 90265 • 310/457-5604
www.davidandersenpianos.com

FROM THE NOVEMBER 2005 JOURNAL OF THE PTG

Open String Tuning and Following the Fourths



Intro : Here's my temperament routine. It might seem strange to you, but it works beautifully for me. It's scary, or at least it was in my case, to "tune as you go," with no temperament strip (which I had used for 27 years), but my decision to go to open string tuning was based upon three things: a challenge by Tom Servinsky, RPT (thanks again, Tom); complete respect for Virgil Smith, Ted Sambell, Franz Mohr, Eric Schandall and other good tuners who use this technique or a variant of it; and my continual frustration with the slight movement of pitch when pulling out the temperament strip and tuning unisons.

The secret to this system is the ability to "shim" or "crack" the unisons. By this I mean the tuner makes extremely small yet stable changes in the pitch of a three-note unison, quickly and cleanly. Learning how to do this has focused my hearing in an extraordinary way. It has made it much easier to voice, and easier to trust my body in all aspects of preparing a great piano for a great player. The more precisely you can use your ears, the better off you and your grateful clients will be.

With open string tuning (OST), you're doing a mini-pitch raise on each note, settling it into place for once and for all (at least for that day!). The temperament stays where you put it with astonishing solidity. This assumes, of course, that the piano is very close to pitch and doesn't have any organic problems holding a tuning.

A FEW HELPFUL HINTS:

1) *Slowly rolling fourths* are at the heart of this system. It takes patient, relaxed listening to really hear how fast the fourths and fifths are beating. Sometimes the true beat doesn't appear for 3-5 seconds after the two notes are played, especially with fourths.
It is easy to get fooled at first. Relax, be patient, and let your ears work.

2) Get ready to become intimately familiar with what I call *shimming unisons* or *cracking the unisons.* This is the practice of making incredibly small changes in the pitch of the three-string unison by "cracking" one string – raising or lowering it ever so slightly – and then matching it with the other two. This is a highly advanced technique, requiring precise control of the tuning lever. However, in my opinion, it is essential for concert-level, musical, rock-solid open tuning.

3 When the temperament is done, I have a "ladder" of fourths moving up from F3 in half steps, like so:

F3-B flat 4
F#3-B4
G3-C4
G#3-C#4
A3-D4
B flat 4-E flat 4
B4-E4
C4-F4

All of those fourths beat the same, or close to the same: slowly rolling, 1.5-2.5 bps. The exception is that A3-D4 and C4-F4 beat slightly faster, maybe even faster than you think would be right. However, my experience has shown that when you listen to the fourths with all three strings open, things seem to even out and the intervals sound smooth and "creamy."

5) Though (almost) all the fourths beat the same, the thirds and sixths beat progressively faster as you ascend through the temperament chromatically, just as in every other temperament scheme.

4) By setting the right string (the first string in the unison that you will tune) a wee bit sharp of where you want it to be, you can anticipate and plan for the fact that the pitch of your 3-string unison will go slightly flat (usually) when you pull the two strings in with the first. When you start to play with

it, you will get some idea of how precise you can get with this system of open string tuning and following the fourths.

Here we go. Remember, everything is open-string. No temperament strip, just one mute. In the following discussion, the note being tuned is always mentioned first, with the relative interval mentioned second.

Step 1) Tune A4, single right string, to A440 tone generator. Then tune center and left strings to right string.

Step 2) Tune A3 to A4 (right string, center, then left string, which is the protocol on all notes). This octave should be "swellingly beatless." By this I mean it should be a tiny bit wide, but with no discernible beat.

Step 3) Tune E4 to A3, fifth. Though fifths in every equal temperament must be narrow of pure, in my system the fifths are almost beatless, only very slightly narrowed. Set E4 to be beatless with A3, then nudge it flat just a tiny bit. Experience has taught me that E4 and F4 tend to flatten slightly over the course of tuning the temperament, so I like to make this E a "frog hair" sharp of where I want it to end up.

Step 4) Tune C4, major third down, to E4. Since C Major is the tonic key in a lot of music, I think of this as the "home key" in the temperament. The speed of this (widened) major third is 10-11 bps, or as close to that as the piano will allow. Each piano is slightly different - on some instruments you may find you need to set this third a little slower. As you progress through the temperament, you can go back and tweak this interval later.

Step 5) Tune F3, down a fifth, to C4. First tune the fifth beatless and then narrow it by raising F3 slightly. Check that the major third F3-A3 is beating about 7.5 bps (this may be a little faster than you're used to, but it's okay.)

Step 6) Tune F4, octave, to F3. Remember to tune F4 a hair sharp, because it may drop. This octave should be tuned "swellingly beatless," like the A3-A4 octave in step 2. Check the fourth, C4-F4, remembering that it can beat a little faster than other fourths.

Step 7) Tune B flat 3, fourth, to F3. All fourths are wide of pure, and this fourth will beat 1.5-2.5 bps (like the 10 bps from C4-E4, this beat speed varies from piano to piano). The upper fifth, formed with B flat 3 and F4,

will be almost beatless. Check F3-B flat 3-F4 (1-4-1) and F3-C4-F4 (1-5-1). Both groups of notes should sound smooth, with the 1-4-1 having ever-so-slightly more movement than the 1-5-1.

Step 8) Tune G3, down a fourth, to C4. First tune the fourth beatless, and then lower the G to widen the interval to 1.5-2.5 bps (closer to 2.5). Check the Major 6th, G3-E4; it should beat a little slower than the C4-E4 major third.

Step 9) Tune D4, fifth up, to G3. The roll in this fifth should be, again, barely perceptible. Other checks are now available to you. The F3-D4 major sixth should be slower than G3-E4 major sixth. There should be progressively faster beat rates on F3-A3 (third), F3-D4 (sixth), B flat 3-D4 (third). The B flat 3-D4 major third should be slower than the major third C4-E4.

Step 10) Tune B3, fourth down, to E4. Flatten B3 to adjust the beat speed in the fourth B3-E4 until the major third G3-B3 matches the major sixth F3-D4.

Step 11) Tune F#3, down a fourth, to B3. Though the fourth must be well wide of pure, you will need to adjust F#3 until the beat speed of the major third F#3-A#3 (or B flat, tuned in step 7) fits exactly between the beat speeds of F3-A3 a step down and G3-B3 a step up.

Step 12) Tune C#4, up a fifth, to F#3, narrow of pure but almost beatless. The A3-C#4 major third should be just a hair slower than B flat 3-D4 major third. If the C#4-F4 major third is beating super-fast at this time, just leave it, it's okay for now (remember that F4 has a tendency to drift flat).

Step 13) Tune G#3, down a fourth, to C#3, widened to about 2 bps.

Step 14) Tune D#4, up a fifth, to G#3, slightly narrow, almost beatless. The A#3-D#4 fourth will be the customary 1.5-2.5 bps, depending on the particular piano.

Now, go chromatically up your "ladder of fourths" to check for even beat speeds all the way up. Remember that it's acceptable to leave A3-D4 and

C4-F4 slightly faster than the rest of the fourths. Check to ensure that the beat speeds of the major thirds and major sixths accelerate slightly as you ascend chromatically.

Outside of the temperament, I do not listen to 3rds, 6ths, and 10ths much at all. I use 4ths, 5ths, and octaves (and multiples of each) to tune all the way down and all the way up. If all the fourths on the piano are beating the same, slow roll, the stretch will be on the money out to the ends of the piano. When I tune this way, I find it's like having an automatic stretch calculator.

You may find that it is easier to tune this new temperament with a temperament strip at first. Try it that way, then pull the strip, tune the unisons and see what happens. Your "ideal" temperament is no longer ideal, having been subtly distorted by the "Virgil Smith phenomenon," i.e., the pitch of a single string changes when the other two strings in the unison are brought in tune with it**. See Q&A in PTJ, May 2005 for a full discussion of this phenomenon.**

I hope this proves helpful; it's a pleasure for me to share my quest for excellence with Journal readers.